

SALIENT FEATURES

Name of the Project	Mathillo Sagu Khola Small Hydropower Project	
Source	Kharta and Kothali Khola	
Type of Development	Run-of-River (R-o-R)	
Project District	Dolakha	
Project Gaupalika /Municipality	Bigu	
Accessibility		
Kathmandu to Charikot	133 km (Black topped Road)	
Charikot to Singati	47.5 km (Black topped Road)	
Singati to Sorung	25 km (Gravel/Earthen Road)	
Sorung to Project Site	10 km (Gravel/Earthen Road)	
Transmission		
Length	18 km (from powerhouse of MSKSHPP to NEA s/s at 132/33 kV Singati S/S)	
Voltage	33 kV	
Hydrology	Kharta	Kothali
Catchment area at Intake side	35 km ²	17 km ²
Design flood at Intake (1 in 100 Years)	21 m ³ /s	10 m ³ /s
General Hydraulics	Kharta	Kothali
Gross head	418.50 m	418.50 m
Design flow	2.00 m ³ /s	0.99 m ³ /s
Capacity	10 MW	
Diversion Weir	Kharta	Kothali
Type	Concrete Boulder	Concrete Boulder
	Lining	Lining
Length	9.30 m	7.05 m
Height	3.0 m from river bed	3.0 m from river bed
Crest elevation	2193.00 masl	2193.00 masl
Intake	Kharta	Kothali
Type	Sub-merged orifice	Sub-merged orifice
	Side intake	Side intake

Size of opening	1.5 m x 1.3 m, 2 nos.	2 m x 1.3 m, 1 No.
Gravel Trap	Kharta	Kothali
Type	Gravity Flushing type	Gravity Flushing
Flushing head	2.30 m	1.70 m
Particle Size to be trapped	5 mm	5 mm
Dimension	7.70 m*3.5 m*3.70 m	7 m*2 m*1.75 m
Approach Canal	Kharta	Kothali
Type	RCC, Box culvert	RCC, Box culvert
Length	31 m	20 m
Size	1.5 m x 1.55 m	1.0 m x 1.1 m
Settling basin	Kharta	Kothali
Type/ No of bays	Gravity Flushing type Double chamber	Gravity Flushing type Single chamber
Nominal size of trapped particles	0.02 mm	0.02 mm
Trap efficiency	90%	90%
Length		
Inlet transition	13 m	8.5 m
Uniform section	51 m	30 m
Width	4.50 m each bay	5.0 m
Depth	4.80 m	3.0 m
Headpond	Kharta	Kothali
Length	12.0 m	11 m
Width	9.25 m	5.0 m
Headrace/Penstock Pipe	Kharta to T-junction	Kothali to T-
	Junction	
Length	2095 m	1425 m
Diameter	1.0 m	0.8 m
	T-junction to Powerhouse	
Length and Internal Diameter	1533 m and 1.20 m ID	
Powerhouse		
Type	Surface	
Size	25.0 m x 16.60 m x 9.0 m	
Tailrace		

Type	RCC Rectangular
Length	46 m
Size	1.5 m x 1.3 m (B x H)

Turbine

Type/No. of units	Pelton / 2 Nos.
Rated output	5000 kW each
Rated net head	400.04 m
Rated Efficiency	90 %
Speed	600 rpm

Generator

Type/ unit	Brushless synchronous / 2 Nos.
Rated Capacity	5900 kVA each
Rated efficiency	96 %
Generation voltage	6.3 kV
Power factor	0.85

Transformer

Type	Step-up Transformer
Unit	1 No.
Rated capacity	12,500 kVA
Rated efficiency	99 %
Vector group	YnD11
Power factor	0.80
Voltage ratio	6.3/33 kV
Frequency	50 Hz

Contract Energy

Annual energy	56.83 GWh (100%)
Dry energy	9.91 GWh (17.44%)
Wet energy	46.92 GWh (82.56%)

Financial parameters (based on 2024 price level, Financial life = 30 years)

Assumptions

Debt—Equity ratio	70:30
Interest rate	10 %
Repayment period	12 Years

Before financing

Total Project cost NRs. 187.18 Cr.

Cost per MW NRs. 18.72 Cr.

After Financing

Total Project cost NRs. 200.51 Cr.

Cost per MW NRs. 20.05 Cr.

Financial Indicators

Project Internal Rate of Return (PIRR) 13.47 %

Equity Internal Rate of Return (EIRR) 16.99 %

Net Present Value (NPV) ‘000 NRs. 549,268

B/C Ratio 1.32

Debt Service Cover Ratios (DSCR) 1.17 (1st year) and 1.50 (12th year)

Average DSCR 1.50

Cost per unit electricity generation NRs. 3.74